STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version 12.01.01c

LRFD

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: Feb. 2003

DRAINAGE AREA : 44.4 sq. mi.
CHARACTER OF TERRAIN : Hilly to mountainous
STREAM CHARACTERISTICS : Ledge gorge through the bridge
NATURE OF STREAMBED : Ledge, some boulders

PEAK FLOW DATA

Q 2.33 =	1900 cfs	Q 50 =	4720 cfs
Q 10 =	3250 cfs	Q 100 =	5500 cfs
Q 25 =	4100 cfs	Q 500 =	7000 cfs

DATE OF FLOOD OF RECORD : November 1927
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ Q50 = 15.4 fps
ICE CONDITIONS : Moderate
DEBRIS: Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Yes
IS ORDINARY RISE RAPID? Yes
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE:

WATERSHED STORAGE: <1%
HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Concrete arch
YEAR BUILT: 1924
CLEAR SPAN(NORMAL TO STREAM): 42'
VERTICAL CLEARANCE ABOVE STREAMBED: 36'
WATERWAY OF FULL OPENING: approximately 980 sq.ft.
DISPOSITION OF STRUCTURE: Remove and replace
TYPE OF MATERIAL UNDER SUBSTRUCTURE: Ledge

WATER SURFACE ELEVATIONS AT:

Q2.33 =	502.6	VELOCITY =	9.5 fps
Q10 =	505.6	"	11.8 fps
Q25 =	507.2	"	14.4 fps
Q50 =	508.5	"	15.4 fps
Q100 =	509.8	"	16.1 fps

LONG TERM STREAMBED CHANGES: There is an 8 ft deep scour hole through the bridge area. No significant changes are anticipated in the future, due to ledge.

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: Above Q100
RELIEF ELEVATION: 530.2
DISCHARGE OVER ROAD @Q100: None

UPSTREAM STRUCTURE

TOWN: Ripton — DISTANCE: 2.5 miles
HIGHWAY # : VT 152 — STRUCTURE #: 14
CLEAR SPAN: 40' — CLEAR HEIGHT: 12'
YEAR BUILT: 1978 — FULL WATERWAY: 480 sq. ft.
STRUCTURE TYPE: Twin cell reinforced concrete box

DOWNSTREAM STRUCTURE

TOWN: Middlebury — DISTANCE: 0.3 miles
HIGHWAY # : T.H. 23 — STRUCTURE #: 21
CLEAR SPAN: 43' — CLEAR HEIGHT: 12'
YEAR BUILT: 1927 — FULL WATERWAY: 550 sq. ft.
STRUCTURE TYPE: Single span steel pony truss bridge

PROPOSED STRUCTURE

STRUCTURE TYPE: New concrete bridge/arch

CLEAR SPAN(NORMAL TO STREAM): 46'
VERTICAL CLEARANCE ABOVE STREAMBED: 40'
WATERWAY OF FULL OPENING: approximately 1125 sq ft

WATER SURFACE ELEVATIONS AT:

Q2.33 =	502.6	VELOCITY=	9.5 fps
Q10 =	505.6	"	11.8 fps
Q25 =	507.2	"	14.4 fps
Q50 =	508.5	"	15.4 fps
Q100 =	509.8	"	16.1 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: Above Q100
RELIEF ELEVATION: 531.0
DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 530.5
VERTICAL CLEARANCE: @ Q50 = 22'

SCOUR: The bridge completely spans a natural ledge gorge.
No significant scour is anticipated.
REQUIRED CHANNEL PROTECTION: Type II Stone Fill above Q100, Type IV below Q10

PERMIT INFORMATION

AVERAGE DAILY FLOW:	92 cfs	
ORDINARY LOW WATER:	42 cfs	DEPTH OR ELEVATION: Elev. 497'
ORDINARY HIGH WATER:	816 cfs	Elev. 500'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: No temporary bridge required
CLEAR SPAN (NORMAL TO STREAM): N/A
VERTICAL CLEARANCE ABOVE STREAMBED: N/A
WATERWAY AREA OF FULL OPENING: N/A

ADDITIONAL INFORMATION

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY
4. ACCESS TO NORTH BRANCH RD SHALL BE MAINTAINED

DESIGN VALUES

1. DESIGN LIVE LOAD		HL-93
2. FUTURE PAVEMENT	d_p:	3.0 INCH
3. DESIGN SPAN	L:	0.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX)	f_y:	270 KSI
6. PRESTRESSED CONCRETE STRENGTH	f'_c:	6.0 KSI
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	5.0 KSI
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'_c:	4.0 KSI
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'_c:	4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'_c:	3.5 KSI
11. CONCRETE, CLASS C	f'_c:	3.0 KSI
12. REINFORCING STEEL	f_y:	60 KSI
13. STRUCTURAL STEEL AASHTO M270	f_y:	---
14. SOIL UNIT WEIGHT	γ:	0.140 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q_n:	4.0 KSF
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
17. NOMINAL BEARING RESISTANCE OF ROCK	q_n:	10.0 KSF
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
19. NOMINAL AXIAL PILE RESISTANCE	q_p:	---
20. PILE YIELD STRENGTH ASTM A572	f_y:	---
21. PILE SIZE		---
22. EST. PILE LENGTH	L_p:	
23. PILE RESISTANCE FACTOR	ϕ:	---
24. LATERAL PILE DEFLECTION	Δ:	---
25. BASIC WIND SPEED	V_{3s}:	---
26. MINIMUM GROUND SNOW LOAD	p_g:	---
27. SEISMIC DATA PGA: ---	S_s:	---
	S_1:	---

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY							
POSTING							
OPERATING							
COMMENTS:							

AS BUILT "REBAR" DETAILS

LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2014	1900	250	55	6.6	95
2034	2000	260	55	10	150

20 year ESAL for flexible pavement from 2014 to 2034 : 417000
40 year ESAL for flexible pavement from 2014 to 2054 : 953000
Design Speed : 25 mph

PROJECT NAME: MIDDLEBURY
PROJECT NUMBER: RS 0174(8)

FILE NAME: r78f217pi.dgn
PROJECT LEADER: J. FITCH
DESIGNED BY: VHB
PRELIMINARY INFORMATION SHEET

PLOT DATE: 01-NOV-2012
DRAWN BY: B.J. MASSE
CHECKED BY: G.S. GOODRICH
SHEET 6 OF 21